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ABSTRACT

This report describes the role of the Tennessee Valley Authority (TVA) in providing programs to upgrade literacy, improve basic education, and enhance job skills. TVA, in cooperation with local, state, and national educational agencies, has developed the TVA region into an education incubation center that tests and evaluates new innovative educational processes and technologies to prepare for the 21st century school. Emphasis is placed on programs for dropout and at-risk students, the adopt-a-school initiative, improvement in subject comprehension, vocational training, instructional technologies, advanced course offerings, adult education, career awareness, and teacher and administrator training. Demonstrations, prototype models, and research are disseminated through TVA's national and state educational organizational networks. The report describes programs located across Tennessee and neighboring states using the technologies of interactive laser disc, computer-aided instruction, and telecommunications. It also includes descriptions of programs in the areas of: (1) school-based education reform; (2) diagnostic prescriptive instruction; (3) vocational education; (4) career awareness; and (5) instructional effectiveness. A breakdown of technical assistance and information requests presents the number of requests by topic for 1990. Attached are five laser-printed summary sheets describing the programs. (KS)

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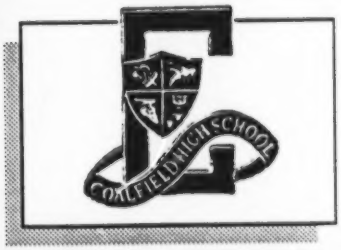
TVA Coalfield Rural Education Demonstration

A Partnership In Laserdisc Learning



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ROLE OF TVA'S

BASIC EDUCATION/TELECOMMUNICATION PROGRAMS

SKILLS DEVELOPMENT DEPARTMENT
VALLEY RESOURCE CENTER

DEPARTMENT'S GOAL

Upgrade literacy, improve basic education, and enhance job skills to help close the gap between workplace needs and work force capabilities.

METHODOLOGY

TVA, in cooperation with local, state, and national educational agencies, has developed the TVA region into an education incubation center that tests and evaluates new innovative educational processes and technologies to prepare for the 21st Century School. These initiatives help to develop the Valley's school delivery infrastructure making it more competitive with the rest of the Nation. Emphasis is placed on programs that address dropout/at-risk students, adopt-a-school initiative, improvement in subject comprehension, vocational training, instructional technologies, advanced course offerings, adult education, career awareness, and teacher/administrator training. Demonstrations, prototype models, and research is disseminated through TVA's national and state education organizational networks.

Interactive Laserdisc Technology

(Futuristic Classrooms)

Valleywide Laserdisc Demonstration - TVA, in cooperation with Davidson and Knox County, Tennessee; Dade and Whitfield County, Georgia; Lauderdale County, Alabama; and Buncombe County, North Carolina Schools, identified 15 initial demonstration sites for an interactive laserdisc technology project. One mathematics program was installed and evaluated. Vanderbilt University's study confirmed the effectiveness of this instructional technology, but also found the instructional methodology was instrumental to program and participant success. Students gained 30-90 percent greater knowledge of subject matter over traditional instructional methods. Teacher and student acceptance and approval was unanimous.

Morgan County, Tennessee Schools - TVA, in cooperation with the State Department of Education, National School Board Association, Morgan County Schools, and private industry, developed a two-year study of laserdisc technology. This comprehensive application of the technology included the areas of mathematics, earth science, chemistry, career education, dropout prevention, and video encyclopedia. Vanderbilt's evaluation indicated 30-80 percent greater mastery, reduced learning time, increased attendance, and reduced dropout rates.

Research data derived, in part, from the Morgan County project led Vanderbilt to the development of the "Jasper Woodbury Series." This series is a simulated real-life problems program which utilizes application-based group activities and Level 3 interactive laserdisc instruction. TVA is a corporate sponsor of the Phase II testing and evaluation of this series. Morgan County is TVA's test site again.

Nashville State Tech - TVA, in cooperation with the State Departments of Education and Economic Development, developed a demonstration of an electrical/electronics-industrial maintenance futuristic instructional lab. This touch-screen interactive training system is training students and employees of area industries in application-based skills to complement the school's present theory-based instruction.

Computer-Aided Instruction (CAI)

(Futuristic Community Learning Centers)

Scott County, Tennessee Schools - TVA, the State Department of Education, Scott County Schools, and JTPA cooperated to establish a computerized community learning center that serves students, adults, and industry. The center utilizes an integrated learning system with over 3,000 hours of courseware in mathematics, reading, language arts, science, and computer education. The center serves at-risk students, illiterate adults, and individuals lacking basic skills both in the school and at the workplace.

The Learning Center was used by 365 individuals during the first year--180 students (86 at-risk) and 185 adults (67 GED prep, 50 Adult Basic Education, and 68 Workplace literacy).

Results:
(1) All students remained in school, and absenteeism dropped dramatically.
(2) Everyone using the system over 20 hours increased subject mastery by 1.6 grade levels.
(3) Twenty-two individuals learned to read.
(4) Thirty-six individuals prepared for and passed their GED.
(5) Ninety-four students enhanced their math and writing skills.
(6) One hundred twenty-seven adults improved their basic skills in math, reading, and language arts.

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West Tennessee - TVA and the State Department of Education are currently funding the establishment of five county-wide computerized learning networks. These networks will consist of "learning labs" which will utilize a microhost computer and a computer-based skills assessment process to diagnose, prescribe, and present instruction and comprehensive primary curriculum support spanning all levels from kindergarten to adult. Several populations will be served: at-risk students, illiterate adults, and adults lacking basic skills. The network will link via modems "learning labs" in schools, businesses, and social service agencies.

Upper East Tennessee - TVA is cooperating with the state of Tennessee and the Upper East Tennessee Educational Cooperative (UETEC) in developing Optional High Schools. These schools will provide adults and hardship case students a "second chance" to earn a regular high school diploma. Each Optional High School will have self-contained classrooms with one teacher per 15 students and be operated on a teacher-directed, individualized instructional approach basis. Basic skills are done with computer-aided instruction (CAI) via 23 restricted programs in reading, math, language, writing skills, science, social studies, survival, and computer skills. The program is open-entry admitting "students" at any academic level. Graduation requires 20 Carnegie units and a mastery level of 11.0 on standardized tests in math, reading, and language arts.

Whitfield County, Georgia - TVA is cooperating with the Dalton/Whitfield County Chamber of commerce in developing a county-wide adult literacy/workplace literacy program. Five adult learning centers and several industry sites will be established, each having "stand-alone" computers with audio, graphics, and management capabilities to individualize instruction in reading for levels kindergarten through adult. Additionally, computer-aided instruction will be provided in language skills, math, science, GED preparation, and survival skills. Project cooperation and funding is provided by state and local agencies and local industry.

Telecommunications

(Regional Economic Development/Educational Networks)

Upper East Tennessee - TVA, in cooperation with the state of Tennessee, Appalachian Regional Commission, and the Upper East Tennessee Education Cooperative (UETEC), is developing a series of community learning centers in the Kingsport, Rogersville, Greeneville, and Johnson City areas. Linked by an educational/economic development telecommunications network, seven sites will be capable of transmitting two-way interactive television (ITV). Programming can be shared with the other six sites and potentially numerous locations via the local cable providers. This will be a hybrid system composed of fiber optic and microwave segments. The network or "cluster" will be used to demonstrate how ITV can assist in maintaining, enhancing, and enriching educational and economic development opportunities for local students, employers, and community residents.

Western Kentucky - TVA, in conjunction with the West Kentucky Educational Cooperative and South Central Bell, are cooperating in the development of a multicounty telecommunications cluster. The network will utilize T1 lines and compressed video to provide two-way interactive television (ITV) capabilities to participants. Schools, community colleges, and higher education institutions will be linked to offer enhanced education and economic development opportunities to local students, employers, and community residents.

Upper East Tennessee - TVA and the East Tennessee State University (ETSU) have cooperated in the development of an Instructional Television Fixed Service (ITFS) microwave network. This broadcast service, when fully operational, will serve the student population, industrial employees, and general residents of nine counties of Upper East Tennessee. The delivery site for the services is the ETSU main campus in Johnson City, Tennessee. The system will deliver instruction to classrooms within 30 miles of Johnson City. Basic/higher education and industrial training services will be made available through this instructional delivery system.

West Tennessee - TVA, in conjunction with Dyersburg State Community College, has completed a study determining the feasibility of implementing a two-way interactive television network in six West Tennessee counties. The study investigated the potential and development costs of four systems--fiber optic, compressed video, microwave, and a hybrid system. The network would link high schools, vocational schools, community colleges, hospitals, and correctional facilities for education and community development purposes. Currently, funding is being sought for implementation of Phase I of this project.

Teacher/Community Empowerment

(School Based Education Reform)

Dalton, Georgia; Chattanooga and Clarksville, Tennessee - TVA, in conjunction with the state's National Education Association, has been cooperating in a national education reform movement to mobilize and organize teachers and community representatives in identifying and testing options for the restructuring of schooling. Research and demonstrations are concentrated on learning, teaching, curriculum, and school reform. Each school has developed an improvement action plan that is being implemented and evaluated by teachers and community leaders. In 1987, TVA sponsored one of six national pilot sites in Dalton, Georgia; and since has expanded efforts to include Chattanooga and Clarksville, Tennessee. A nationwide electronic mail network has been established to share and communicate research and other information with schools throughout the Nation.

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Instructional Effectiveness

(Diagnostic Prescriptive Instruction)

McCracken County, Kentucky, and Union County, Mississippi - TVA, in cooperation with the National Association of Secondary School Principals (NASSP), McCracken, and Union County Schools, demonstrated the effectiveness of the Learning Styles Profile (LSP). LSP was developed by NASSP as an instrument to assess a broad spectrum of research-based learning style elements. The LSP contains 23 independent scales representing four higher order factors: cognitive skills, perceptual responses, study preferences, and instructional preferences. This demonstration utilized LSP as a diagnostic tool to identify students' learning style strengths and weaknesses, and provide greater personalization of instruction. Teachers were taught to organize instructional materials and instruct according to the students' learning preference.

Vocational Education Programs

(Area Training Programs)

West Kentucky State Vocational-Technical School (Paducah) - TVA and West Kentucky State Vocational-Technical School cooperated in the development and implementation of a river industry barge deckhand training program. There are over 5,000 marine industry-based jobs in the Paducah area alone. Only two formal deckhand training programs existed in the U.S. prior to this program. This project, with the support and assistance of the Purchase Area Private Industry Council, the U.S. Coast Guard, and private industry, has become a national center of technical expertise as it relates to deckhand training. Since initiation, the program has experienced 100 percent placement, and enrollment demands exceed capacity.

Blue Ridge Technical College - TVA and Blue Ridge Technical College are cooperating in a project to develop instructional materials for use in a transportation training program for truck operators. This program is an extension of an existing two-phase program with 80 hours of classroom instruction and 300 hours of inplant/over-the-road experience. The Department of Community Colleges, North Carolina Community College System, and the Professional Truck Drivers Institute of America, Inc., are also cooperating in this effort to develop a national curriculum and training demonstration for truck operators.

Southwest Virginia - TVA is cooperating with the Southwest Virginia Community College on the development of a Coal Diversification Industrial Training Program. TVA has assisted with development and implementation of industrial training programs to meet the needs of area industries prompted by the downturn in the region's coal operations. Training in quality control, hydraulics and pneumatics, and introduction to computer-aided design (CAD) has been offered. These programs are delivered via satellite transmission or on-campus classes. The college is currently incorporating these courses into their existing curriculum, and is in the process of developing three new courses.
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Career Awareness

Valleywide - TVA, Nintendo of America, Inc., and Ruby Spears Enterprises, Inc., cooperated to develop the basic career awareness film "JOBTALK" using a commercialized presentation of a video animated character, which is owned by Nintendo under the trademark named "Donkey Kong." TVA has initiated projects throughout the Valley which are directed at developing career awareness among elementary and secondary school teachers and students. This program was developed because increasing youth unemployment, changing technology, and labor force imbalances have had a detrimental effect on graduating students entering the work force. This film and an accompanying activity package is designed for approximately three hours of instruction. The intent of this material is to expose middle school-age students to a self-directed exploration of career awareness. Subtlety, comedy, and excitement provide students the opportunity to explore possibilities and form their own conclusions as to the major issues facing them in career choices and direction.

West Tennessee - TVA, in cooperation with the Tennessee Department of Education, has developed a program to improve regional education, career guidance, and student motivation. The "Education for Employment" program requires close cooperation by education, the community, parents, business, and industry. Education for Employment is a comprehensive career development program that strengthens the guidance program in schools by linking classroom instruction with guidance by incorporating career awareness activities into present subject matter for all students grades K-12. This concept provides students with the knowledge and information needed to live and work in today's society. Education for Employment provides:

1) An avenue for education to form partnerships with parents, business, industry, and the community;

2) An opportunity for students to experience an active relationship between classroom learning and the world of work; and

3) Demonstrates a building block approach beginning in kindergarten with self-awareness and positive motivation and continuing on through high school with decisionmaking, career exploration, career preparation, and job acquisition skills training.

Teacher/Administrator Training

(Instructional Effectiveness)

Institute for Educational Technology (IET) - TVA, in cooperation with The University of Tennessee (Knoxville), Carson Newman College, and the National Center for Aquatic Education, is developing a consortium for the advancement of educational technologies. The IET has five major objectives:

1) To provide training in education technologies utilized for education, industry, and government;

2) To serve as a clearinghouse for compiling, evaluating, and disseminating information about educational technologies and their applications;

3) To serve as a resource and demonstration center for users to evaluate educational technologies and applications in a "hands on" environment;

4) To provide a research program to evaluate current and future educational technologies and courseware;

5) To develop and produce educational and training courseware.

Technical Assistance/Information Requests

TVA responds to information, training, and technical assistance requests in reviewing, evaluating, or replicating current or past educational demonstrations. Information is disseminated by means of individual/group consulting, conducting workshops, and public speaking. Requests have been received from such agencies as State Boards of Education, educational associations, colleges and universities, local school systems, private industry and, individuals.

1990 Breakdown

Topic	Number of Request
Laserdisc Instruction	40
Telecommunications	30
Literacy	25
Career Awareness	35
Computer-Aided Instruction	30
Teacher/Community Empowerment	10
Information "TVA's Role in Education"	15
Instructional Effectiveness	30
Vocational Education	10

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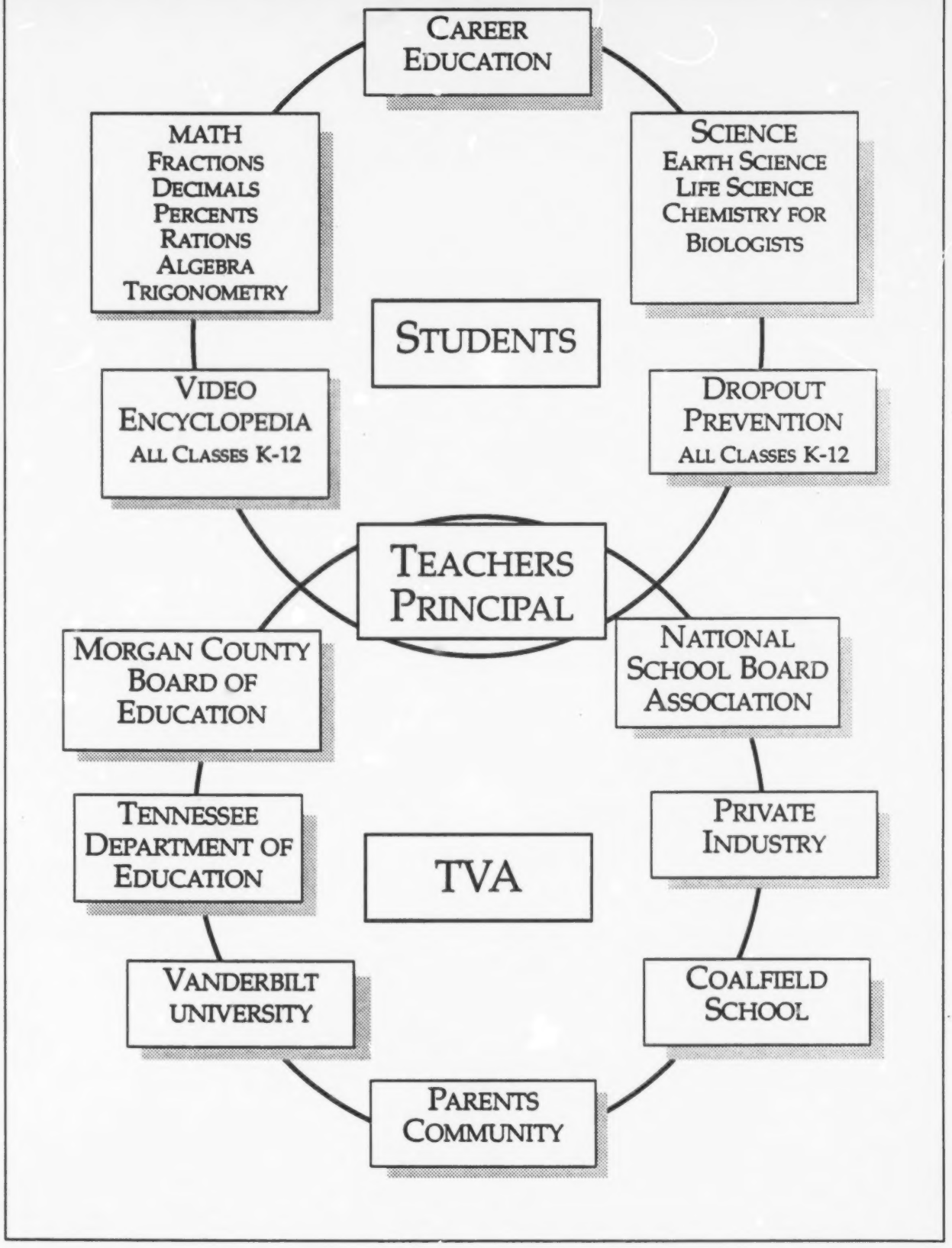
TVA Coalfield Rural Education Demonstration

The TVA-Coalfield Rural Education Demonstration Project was a two-year program designed to evaluate the effectiveness of interactive videodisc instruction. Initiated in 1987, local, federal, and state agencies joined in a unique partnership to develop a futuristic instructional laboratory in Coalfield, Tennessee.

- Coalfield School is located in Morgan County, Tennessee.
- Comprising grades K-12, Coalfield School has a student population of 580.
- Areas of application: science, mathematics, dropout prevention, career education, and video encyclopedia.
- Evaluation of demonstration conducted by Peabody College of Vanderbilt University, Nashville, Tennessee.

TVA Coalfield Rural Education Demonstration



DEMONSTRATION OBJECTIVES

- DEVELOP COMPETITIVE EDUCATION IN RURAL COMMUNITIES
- IMPROVE ACADEMIC ACHIEVEMENT USING INTERACTIVE LASER VIDEODISC INSTRUCTION
- ENHANCE THE USE OF TECHNOLOGY IN ACADEMIC CURRICULA
- INTRODUCE INNOVATIVE TEACHING TECHNIQUES TO ENHANCE TEACHER EFFECTIVENESS AND PRODUCTIVITY.

INSTRUCTIONAL METHODOLOGY

- REVIEW (CHECK PREVIOUS DAY'S WORK AND RETEACH, IF NECESSARY)
- PRESENT NEW CONTENT/SKILLS
- GUIDED STUDENT PRACTICE (CHECK UNDERSTANDING)
- FEEDBACK AND CORRECTIVES (RETEACH, IF NECESSARY)
- INDEPENDENT STUDENT PRACTICE
- WEEKLY AND MONTHLY REVIEWS

BENEFITS OF INTERACTIVE VIDEO INSTRUCTION

(AS DOCUMENTED BY INDUSTRY)

REDUCTION IN LEARNING TIME

- Master subject matter in 25-40 percent less time than traditional methods.

INCREASED LEARNING

- Score 33-70 percent higher on mastery tests than individuals who use traditional curriculum and methodology (videotape or instructor).

LEARNING RETENTION

- Performance retention after initial instruction 20-40 percent greater than traditional instruction.

TRAINING COSTS REDUCED

- Less instructional time required to master learning material.
- Less remedial training required.
- Longevity and durability of materials.